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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,120	09/08/2003	John G. Maneatis	TCU 327	9692

23581 7590 03/22/2005

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EXAMINER

SHINGLETON, MICHAEL B

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,120

Applicant(s)

MANEATIS, JOHN G.

Examiner

Michael B. Shingleton

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 21-33 and 46 is/are rejected.
- 7) ☒ Claim(s) 6-20, 34-45 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/10/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

Claim 21 is objected to because of the following informalities: Note that “delivered bythe” is incorrect and it is believed that “delivered by the” was meant instead. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 23-25 and 27-33 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Gillig 5,424,689 (Gillig).

Figure 4-7 and the relevant text of Gillig discloses a fast-locking phase locked loop (pll) system and method of modifying an output signal (OUTPUT SIGNAL) in a PLL having a voltage controlled oscillator (VCO) 423, a reference signal source 401, a low current charge pump 411 and a high current charge pump (Unmarked in figure 4). Being that the device of Gillig is a PLL, the current charge pumps contained therein clearly controls the phase and frequency of the output signal i.e. a certain frequency will have a certain phase. The low current charge pump is the charge pump that is the “run-time” charge pump for it operates when the high current pump is no longer active and it is this charge pump that maintains the lock condition of the PLL (See the paragraph bridging columns 3 and 4 of Gillig.). This passage of Gillig also recites that the “high” current charge pump is of a larger magnitude than the “low” current charge pump. The high current charge pump is also sometimes called the “additional charge pump” by applicant in some of the claims of the instant application. Gillig also clearly shows and discloses that the error detector is the phase detector 405 and the cycle slip detector is the combination of the phase detector and the dead zone circuit 413 of Gillig. The passage bridging columns 3 and 4 noted above makes it clear that the dead zone circuit only works when the error is large, i.e. a complete cycle of the first periodic input signal (reference source.) has occurred within a current cycle of the second periodic input signal (The fed back signal applied to the error detector in Gillig.). Thus Gillig clearly meets the limitation of a “cycle slip detector”. Note that it is only when the two cycles match or are so very very close that the high current source is turned off (See the paragraph bridging columns 3 and 4).

Such is the case with the disclosed invention of applicant. When lock is obtained then the charge pump 280 does not function in applicant's invention. The high current charge pump source clearly makes the pll of Gillig achieve lock "fast" as compared to the pll that does not have the high current source for the bandwidth is widen by charging the capacitors that set the input voltage for the VCO at a faster rate. As noted above since the high current charge pump source does not work all the time like the low current charge pump source the functional language "that the additional charge pump is activated less often than the run-time charge pump" is clearly met. Claims like claim 28 recites that the additional charge pump is activated "only during startup of the phase-locked loop system or recovery of the phase locked loop system from a dormant state." When one looks to the specification one broadest reasonable interpretation would be that these times set forth in claims like claim 28 are defined by the detection of a "cycle slippage" and a system not in lock would be considered to be a dormant state (See MPEP 2111). Thus since Gillig detects a "cycle slippage" as meant by applicant, the additional charge pump of Gillig is activated "only during startup of the phase-locked loop system or recovery of the phase locked loop system from a dormant state." This is what applicant apparently means by a recovery from a dormant state and startup. Also the conductor line 415 of Gillig would be considered to be "an enable line" as meant by applicant as set forth in at least claim 33 for given the lack of a specific definition by applicant the broadest reasonable interpretation would be any line that enables the device it is connected to. As the paragraph bridging columns 3 and 4 of Gillig makes clear the signal 415 when not present disables the high current charge pump and thus this is an enable line that causes the cycle slip detector of Gillig to be operatively coupled with the higher-current charge pump via the enable line. This signal is also called an "activating signal" in some of the claims. A signal that activates a circuit is a signal that enables the circuit. Note that the VCO produces an output signal.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 26 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gillig et al. 5,424,689 (Gillig).

The same reasoning as applied in the above 35 USC 102 rejection of claims over Gillig applies here and the following: Claims like claims 21, 26 and 46 recite that the additional charge pump produces current that are at least an order of magnitude greater than the charge pumps produced by the run-time charge pump. Gillig appears to be silent on just how much larger the high current charge pump is compared to the low current charge pumps. As this is a result effective variable, i.e. the choice of how large to make the additional charge pump compared to the run-time charge pump determines how fast the pll of Gillig locks as is clearly evident in Gillig, the choice of making the additional charge pump of Gillig to be an order of magnitude larger than the run-time current charge pump only involves routine skill in the art (See MPEP 716.02 and 2144.05).

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the additional current charge pump to be an order of magnitude greater than then the run-time current charge pump in Gillig as this is a result effective variable that determines how fast the pll of Gillig locks and this selection is the selection of the optimum or workable range that involves but routine skill in the art.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gillig et al. 5,424,689 (Gillig) in view of Jeong 5,705,947 (Jeong) of record.

The same reasoning as applied in the above 35 USC 102 rejection of involving Gillig applies here and the following: Claim like claim 4 recites the error detector as a "phase frequency detector". Gillig just names his error detector a phase detector. Note that like above the phase detector does control the phase in an indirect manner in that the specific frequency output will occur with a specific phase. However, Gillig is silent on controlling the phase in a direct manner.

It is well known in the pll art to use a "phase frequency detector" so as to allow for the direct control of the phase as well as the frequency in a phase locked loop. See column 5 around line 55 of Jeong.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the phase detector of Gillig with a phase frequency detector so as to allow for the direct control of the phase as taught by Jeong.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gillig et al. 5,424,689 (Gillig) in view of Olgaard 6,118,346 (Olgaard).

The same reasoning as applied in the above 35 USC 102 rejection of claims over Gillig applies here and the following: Claims like claim 22 recite a "x/y" type of pll. This is a conventional form of pll wherein the reference signal source is divided by a divider "x/y" and the feedback signal is divided by a

divider “/x”. Gillig clearly has the “/x” divider 406 but lacks the “/y” divider after the reference source in order to make what applicant refers to as a “x/y” pll.

It is common place to provide a “/y” divider in the reference signal path of a pll so as to form a x/y PLL. See Figure 1 and column 1 around line 25 of Olgaard. This clearly allows for the reference source of the PLL to produce more than one frequency applied to the phase comparator as is clearly illustrated.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a “/y” divider between the reference source 401 and the error detector so as to form a x/y PLL as to allow for a single reference source to produce more than one frequency thereby increasing the range of the PLL as taught by Olgaard.

As noted in the 35 USC 102 rejection, the cycle slip detector detects a cycle slip, i.e. a large error or otherwise known as a unlocked state. Claims like claim 22 recites that “such detection being based upon reference intervals of the reference signal an output intervals of the output signal, a given reference interval being defined by two successive triggering edges of the reference signal and a given output interval being defined by $(x/y + 1)$ successive triggering edges of the output signal”. It is important to note that this does not recite that the edges are actually directly detected only that the detection is based on the reference interval of the reference signal and output intervals of the output signal. Given the broadest reasonable interpretation of the claims since these recited reference intervals with associated triggering edges as set forth by the claims results when the pll is out of lock and the combination of Gillig and Olgaard detects the out of lock condition, i.e. the large error signal this in effect detects in an indirect manner the recited reference intervals and associated triggering edges as claimed. Thus the detection of the combination of Gillig and Olgaard made obvious above is “based upon reference intervals of the reference signal an output intervals of the output signal, a given reference interval being defined by two successive triggering edges of the reference signal and a given output interval being defined by $(x/y + 1)$ successive triggering edges of the output signal”. The claims recites conditions for an x/y pll that set forth an unlocked state which are detected in the combination of Gillig and Olgaard made obvious above and thus this detection is an obvious consequence of this combination made obvious above.

Allowable Subject Matter

Claims 6-20 and 34-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770. The examiner can normally be reached on Tues-Fri from 8:30 to 4:30. The examiner can also be reached on alternate Mondays. The examiner normally has the second Mondays of the bi-week off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS

March 1, 2005


Michael B Shingleton
Primary Examiner
Art unit 2817